

## Compliant. Precise. Reliable.

### FUS Insertion Unit

Symmetrical insertion unit with centric locking and monitoring.

#### Field of Application

Assembly tasks with very little play among the parts to be aligned



#### Advantages – Your benefit

**Pneumatic, centric locking** puts the unit back to a defined zero position and protects the elastomers

**Layered elastomer construction** soft and flexible when aligning, rigid when pressing in

**Compensates alignment errors** thereby reducing the danger of jamming



Sizes  
Quantity: 5



Compensation XY  
 $\pm 1.7 \dots 2.2 \text{ mm}$

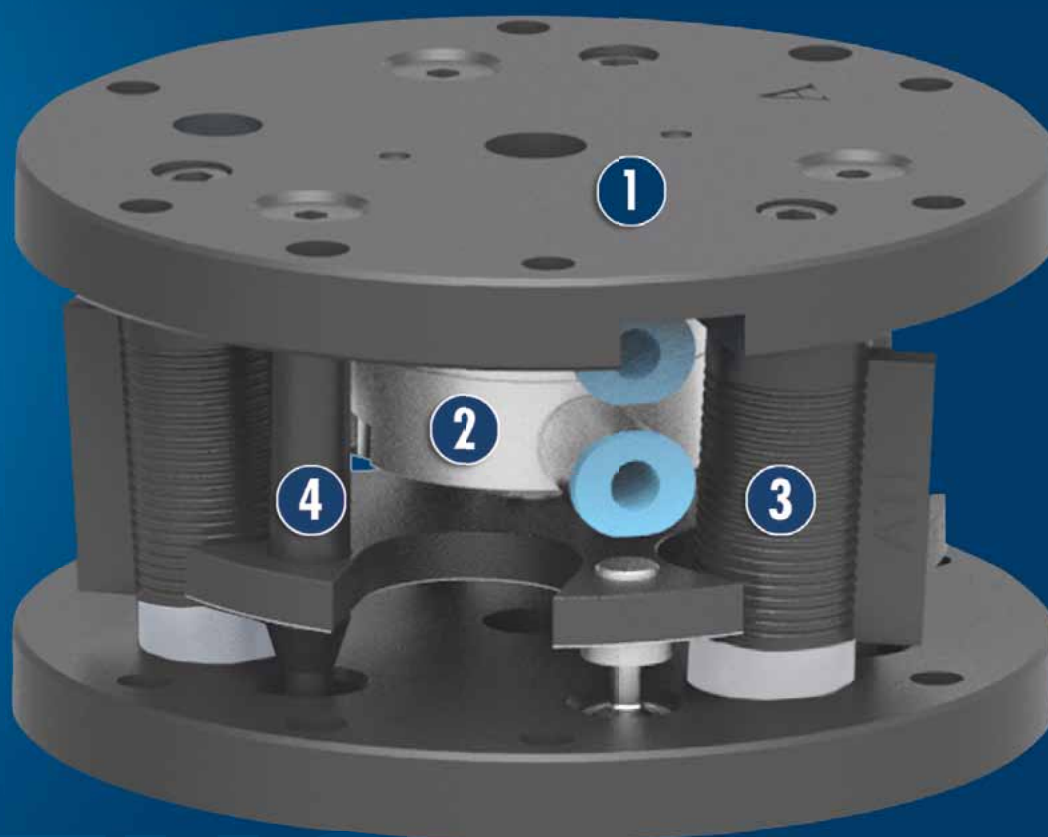


Rotary compensation angle  
 $2.5 \dots 5^\circ$

## Functional Description

The FUS' function is based on the interaction between the two base plates, which are connected to each other by a set of 3 or 6 flexible elastomer elements. As a result, the FUS can compensate tolerances in the X- and Y-directions, allowing it to correct angle errors and provide rotational compensation.

The FUS offers pneumatic locking to allow the compensation unit to be set to rigid. As a result, it is possible to prevent the tool or the gripper vibrating during movement of the robot arm or the linear axis. This increases the application's repeat accuracy and extends the service life of the elastomer elements.



### ① Adapter flange

M3 (2x) Individual screw connection diagrams can be easily integrated

### ② Pneumatic locking

for a rigid connection between the machine and tool sides

### ③ Elastomers

allow for the compensation

### ④ Overload pin

to protect the elastomers

CAD data, operating manuals and other current product documents are available at [www.schunk.com](http://www.schunk.com)

## General Notes to the Series

**Monitoring:** by inductive proximity switch

**Actuation:** pneumatic, with filtered compressed air as per DIN ISO 8573-1: 7 4 4

**Material:** Elastomer material

**Housing:** Aluminum

**Scope of delivery:** without mounting screws

**Warranty:** 24 months (details, general terms and conditions and operation manuals can be downloaded at [www.schunk.com](http://www.schunk.com))

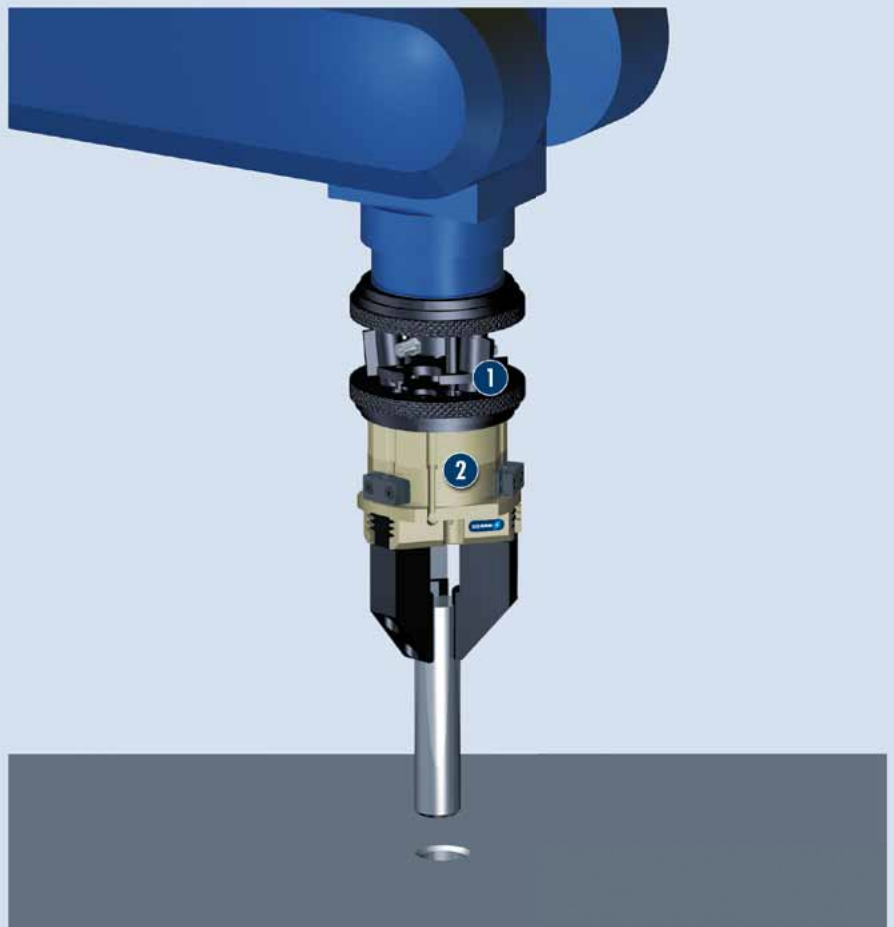
**Harsh environmental conditions:** Please note that the use in harsh environmental conditions (e.g. in the coolant area, cast and grinding dust) can considerably reduce the service lifetime of the units, and will void warranty. However, in many cases we can find a solution. Please contact us.

**Handling weight:** The weight of the total load attached to the flange. The design must take into account the permissible forces and moments. Please note that the life span will be reduced if the maximum handling weight is exceeded.

## Application example

Inserting a bolt into a bore

- 1 FUS-113B Insertion Unit
- 2 PZN-plus 80 3-Finger Centric Gripper



## SCHUNK offers more ...

The following components make the FUS even more productive – the perfect complement for highest functionality, flexibility, and process reliability.



Inductive Proximity Switches



Extension Cable



PGN-plus Universal Gripper



SWS Quick-change Systems



PWG-plus Angular Gripper



MWS Manual Gripper Change Systems



PZN-plus Centric Gripper

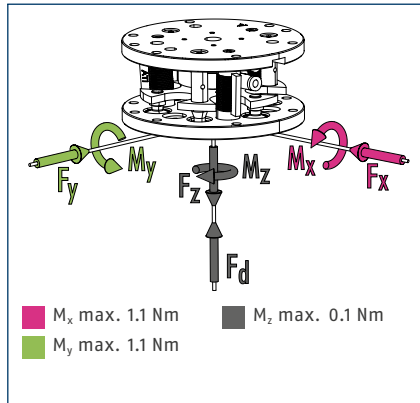
① Further information regarding the products can be found on the following products pages or at [www.schunk.com](http://www.schunk.com). Please contact us for further information: SCHUNK technical hotline +49-7133-103-2696

# FUS 001-30

Robot Accessories | Compensating | Insertion Unit



## Forces and moments

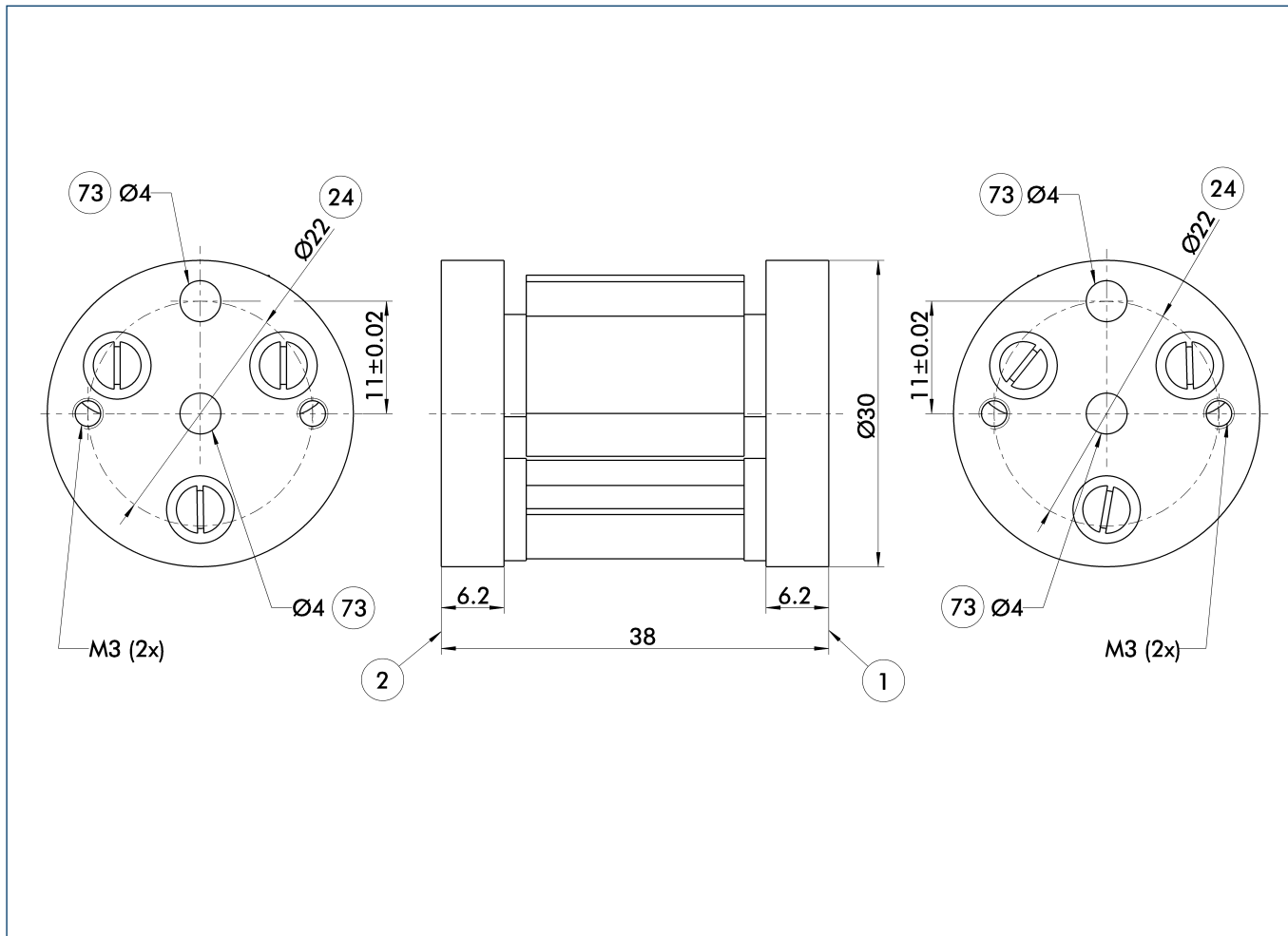


① The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

## Technical data

Description		FUS-001-30
ID		0320280
Compensation tension / pressure	[mm]	0.4
Compensation XY	[mm]	±1.7
Angular compensation	[°]	1
Rotary compensation angle	[°]	4.5
Stiffness tension / pressure	[N/mm]	385
Stiffness displacement	[N/mm]	7.5
Compensation center clearance	[mm]	23
Repeat accuracy	[mm]	0.05
Mass	[kg]	0.05
min. / max. operating pressure	[bar]	5/6
min. / max. ambient temperature	[°C]	5/60
max. force $F_x/F_y$ horizontal installation	[N]	3
max. force $F_z$	[N]	9
max. force $F_d$	[N]	160

Main view



The main view shows the unit in its basic version.

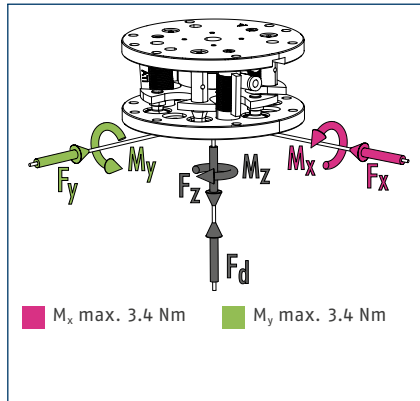
- ① Robot side connection
- ② Tool side connection
- ②④ Bolt circle
- ⑦③ Fit for a centering pin

# FUS 001

Robot Accessories | Compensating | Insertion Unit



## Forces and moments

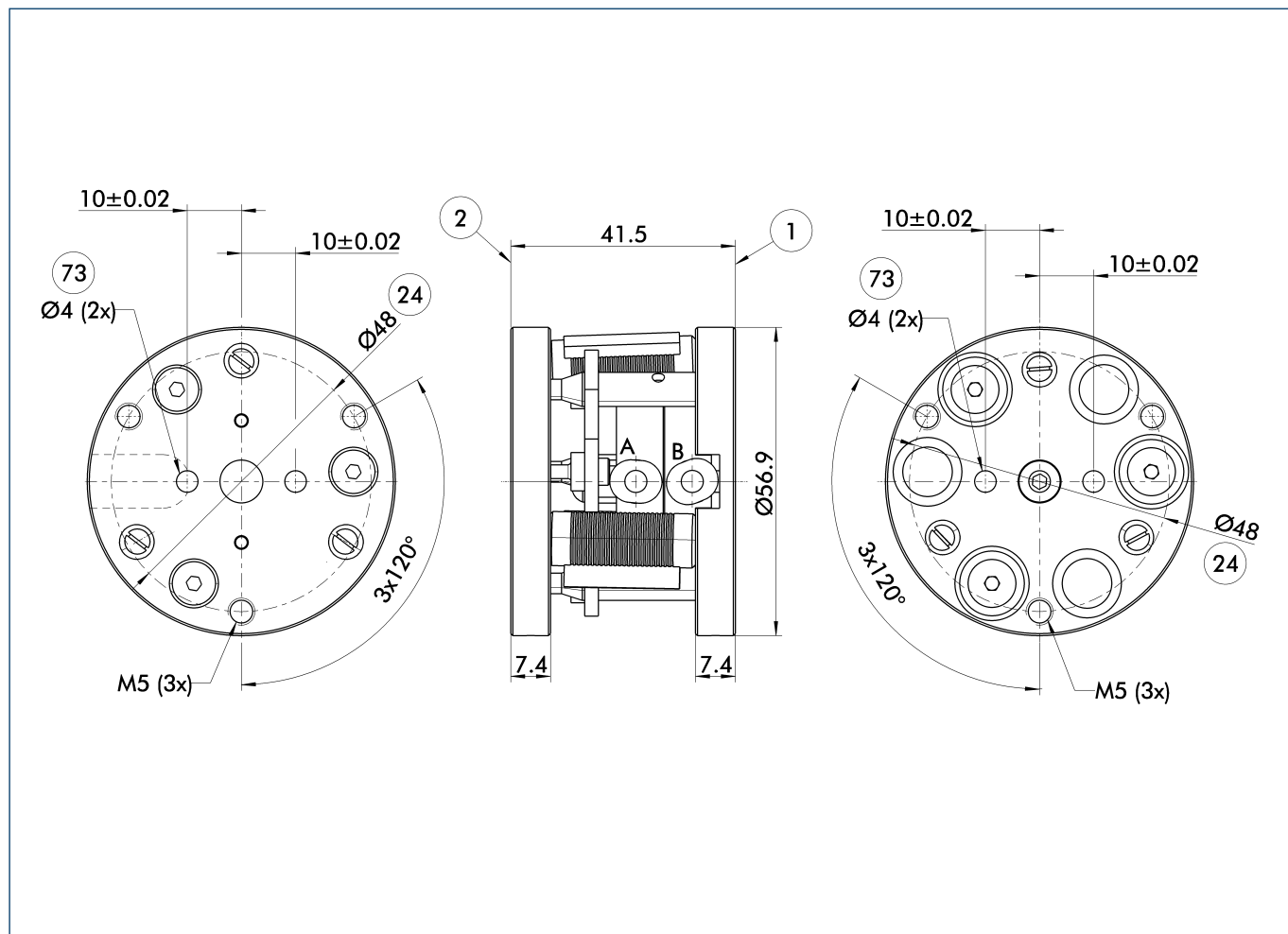


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

## Technical data

Description		FUS-001
ID		0320518
Compensation XY	[mm]	±1.7
Angular compensation	[°]	1
Rotary compensation angle	[°]	4.5
Stiffness displacement	[N/mm]	1.7
Compensation center clearance	[mm]	23
Repeat accuracy	[mm]	0.05
Mass	[kg]	0.18
min. / max. operating pressure	[bar]	5/6
min. / max. ambient temperature	[°C]	5/60
max. force $F_x/F_y$ vertical installation	[N]	22
max. force $F_x/F_y$ horizontal installation	[N]	6.7
max. force $F_z$	[N]	22
max. force $F_d$	[N]	360

Main view



The main view shows the unit in its basic version.

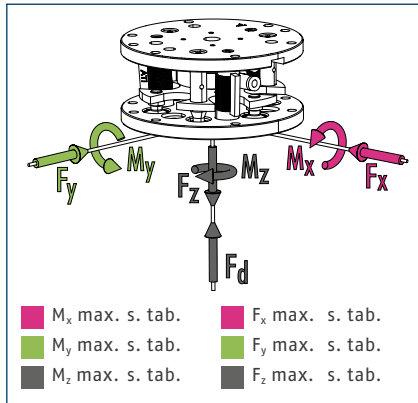
- A, a Air connection locked
- B, b Air connection unlocked
- ① Robot side connection
- ② Tool side connection
- ②4 Bolt circle
- ⑦3 Fit for a centering pin



# FUS 100

Robot Accessories | Compensating | Insertion Unit

## Forces and moments

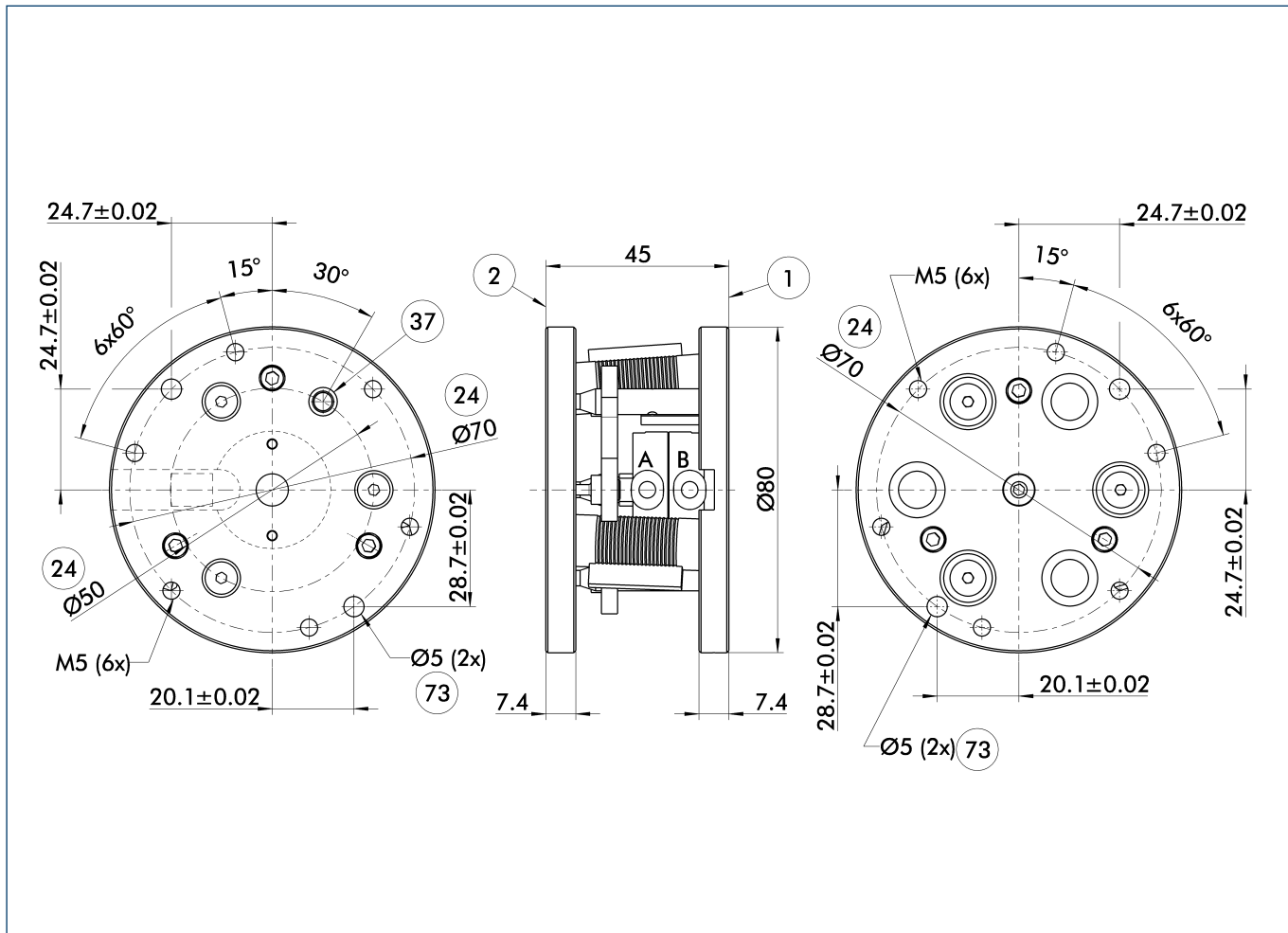


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

## Technical data

Description		FUS-111B	FUS-112B	FUS-113B
ID		0320519	0320522	0320525
Compensation XY	[mm]	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1
Rotary compensation angle	[°]	5	5	5
Stiffness displacement	[N/mm]	11	7	27
Compensation center clearance	[mm]	120	69	61
Mass	[kg]	0.31	0.31	0.31
min. / max. operating pressure	[bar]	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. force $F_x/F_y$ vertical installation	[N]	45	45	80
max. force $F_x/F_y$ horizontal installation	[N]	8.9	8.9	27
max. force $F_z$	[N]	44	44	80
max. force $F_d$	[N]	1300	530	1300
Moments $M_x$ max./ $M_y$ max.	[Nm]	5.1/5.1	5.1/5.1	7.9/7.9

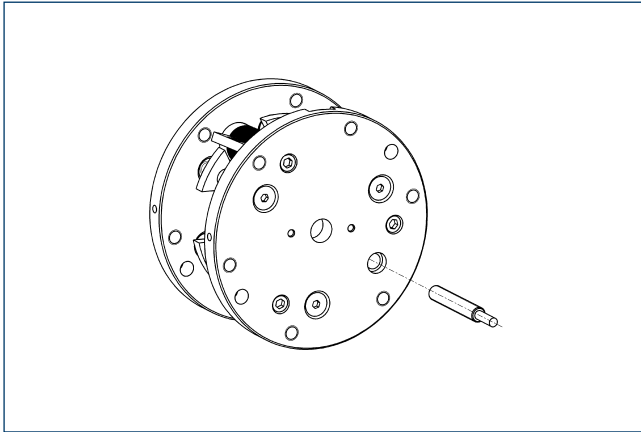
Main view



The main view shows the unit in its basic version.

- A, a Air connection locked
- B, b Air connection unlocked
- ① Robot side connection
- ② Tool side connection
- ②4 Bolt circle
- ③7 Sensor connection
- ⑦3 Fit for a centering pin

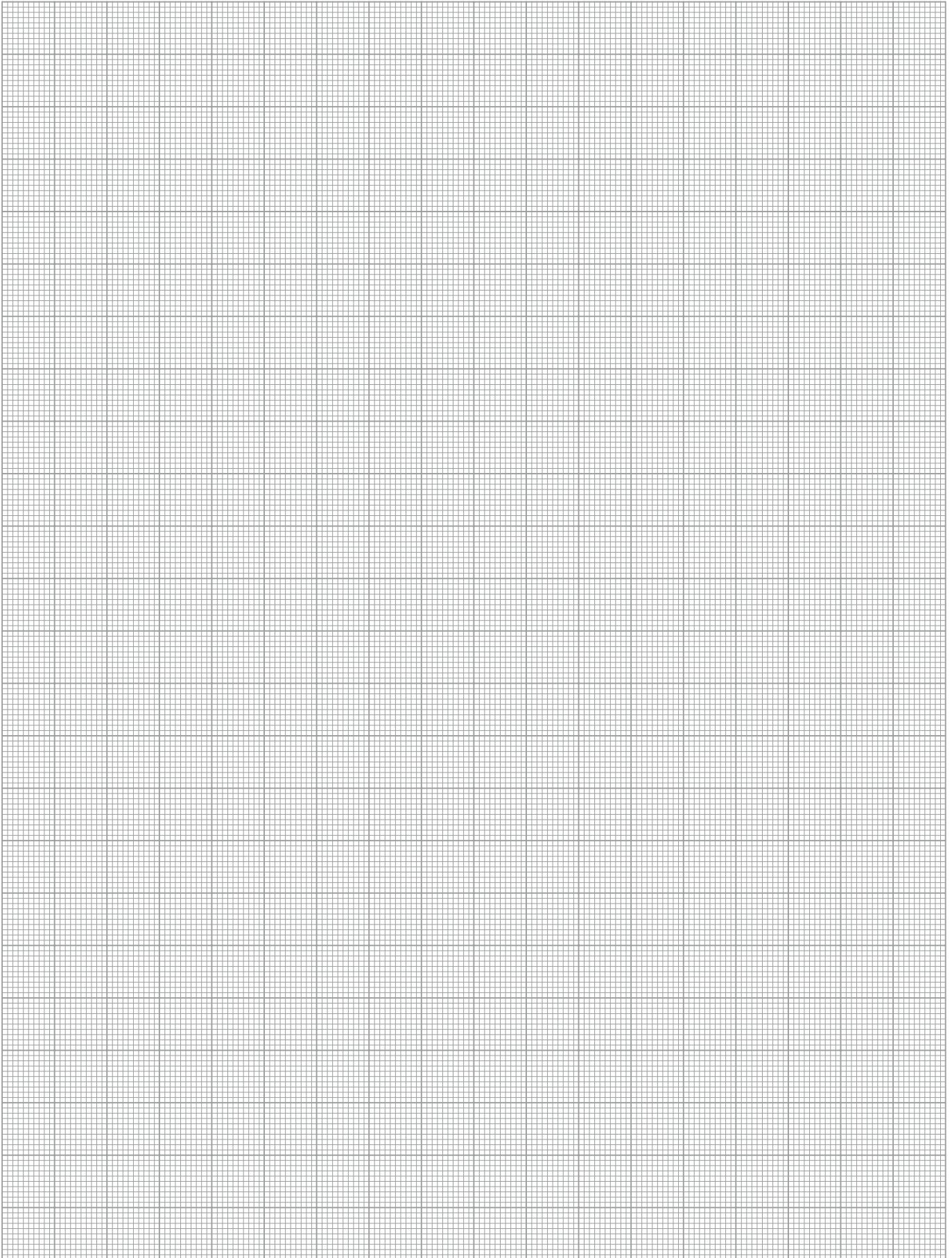
## Sensor system



Locking sensor for monitoring the lock condition

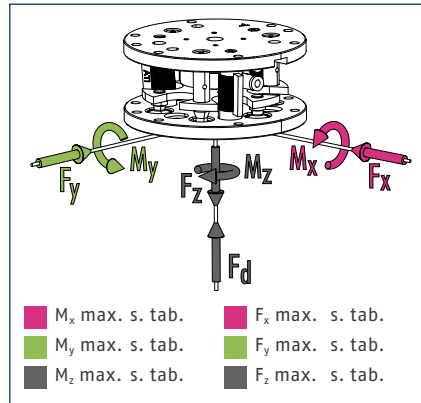
Description	ID	Often combined
<b>Inductive proximity switches</b>		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
<b>Cable extensions</b>		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
<b>Clip</b>		
CLI-M12	0301464	
CLI-M8	0301463	
<b>Connection cables</b>		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
<b>Sensor distributor</b>		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

- ① Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.





### Forces and moments



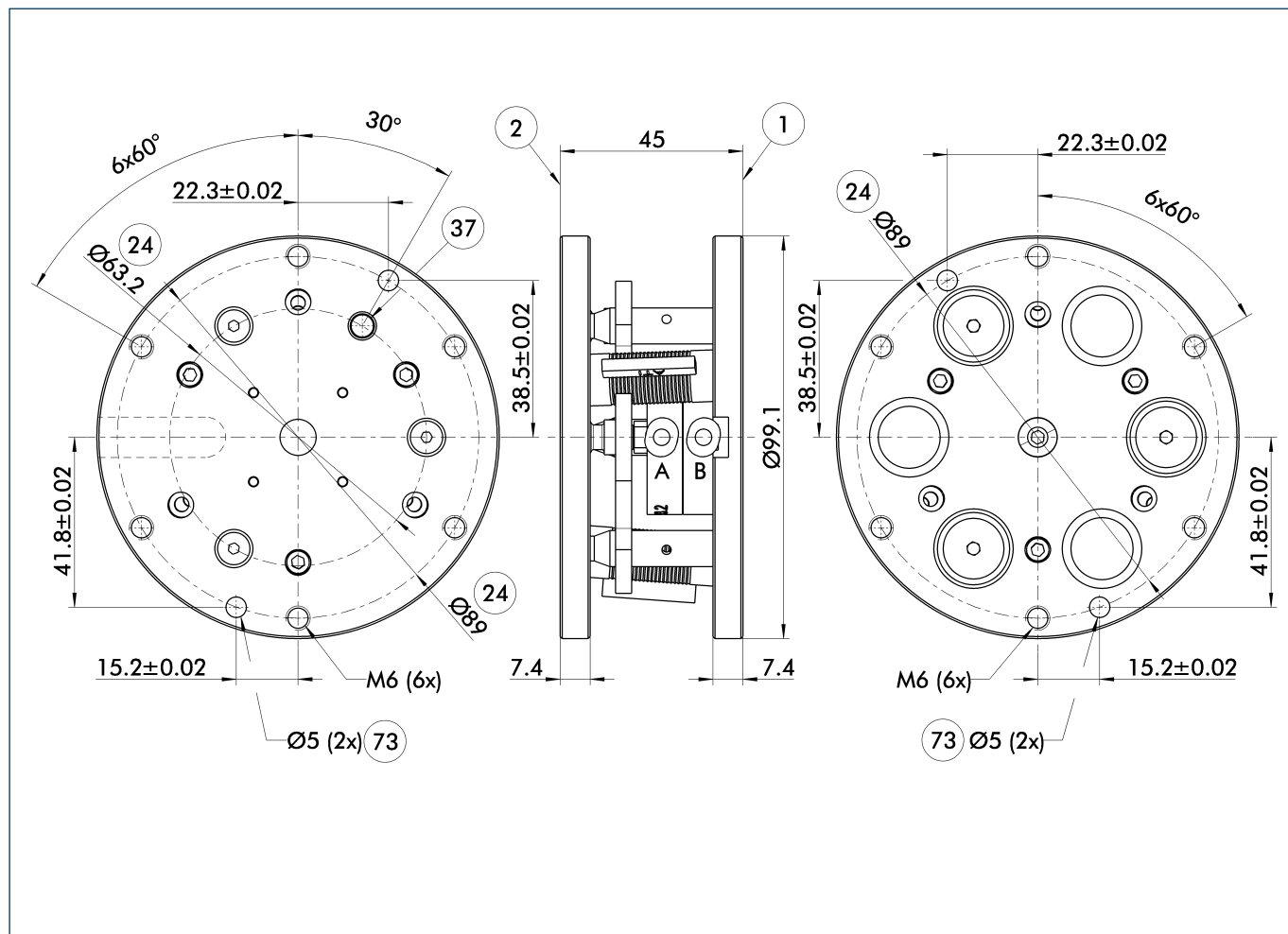
ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

### Technical data

Description		FUS-211A	FUS-211B	FUS-211C	FUS-212A	FUS-212B	FUS-212C
ID		0320527	0320528	0320529	0320530	0320531	0320532
Compensation XY	[mm]	±2.2	±2.2	±2.2	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1	1.1	1.1	1.1
Rotary compensation angle	[°]	4	4	4	4	4	4
Stiffness displacement	[N/mm]	11	11	23	7	7	14
Compensation center clearance	[mm]	140	150	150	81	91	86
Mass	[kg]	0.5	0.5	0.5	0.5	0.5	0.5
min. / max. operating pressure	[bar]	5/6	5/6	5/6	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60	5/60	5/60	5/60
max. force $F_x/F_y$ vertical installation	[N]	53	53	107	62	62	125
max. force $F_x/F_y$ horizontal installation	[N]	8.9	8.9	18	8.9	8.9	18
max. force $F_z$	[N]	53	53	110	62	62	120
max. force $F_d$	[N]	1300	1400	2700	620	710	1300
Moments $M_x$ max./ $M_y$ max.	[Nm]	6.8/6.8	7.3/7.3	14/14	6.8/6.8	7.3/7.3	14/14

Description		FUS-213A	FUS-213B	FUS-213C
ID		0320533	0320534	0320535
Compensation XY	[mm]	±2.2	±2.2	±2.2
Angular compensation	[°]	1.1	1.1	1.1
Rotary compensation angle	[°]	4	4	4
Stiffness displacement	[N/mm]	26	26	52
Compensation center clearance	[mm]	74	82	79
Mass	[kg]	0.5	0.5	0.5
min. / max. operating pressure	[bar]	5/6	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60	5/60
max. force $F_x/F_y$ vertical installation	[N]	98	98	196
max. force $F_x/F_y$ horizontal installation	[N]	27	27	54
max. force $F_z$	[N]	98	98	196
max. force $F_d$	[N]	1360	1400	2770
Moments $M_x$ max./ $M_y$ max.	[Nm]	8.5/8.5	9/9	17.5/17.5

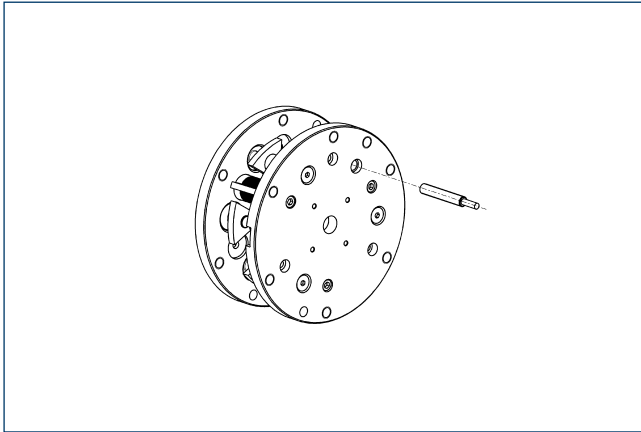
Main view



The main view shows the unit in its basic version.

- |                              |                            |
|------------------------------|----------------------------|
| A, a Air connection locked   | ② Tool side connection     |
| B, b Air connection unlocked | ②④ Bolt circle             |
| ① Robot side connection      | ③⑦ Sensor connection       |
|                              | ⑦③ Fit for a centering pin |

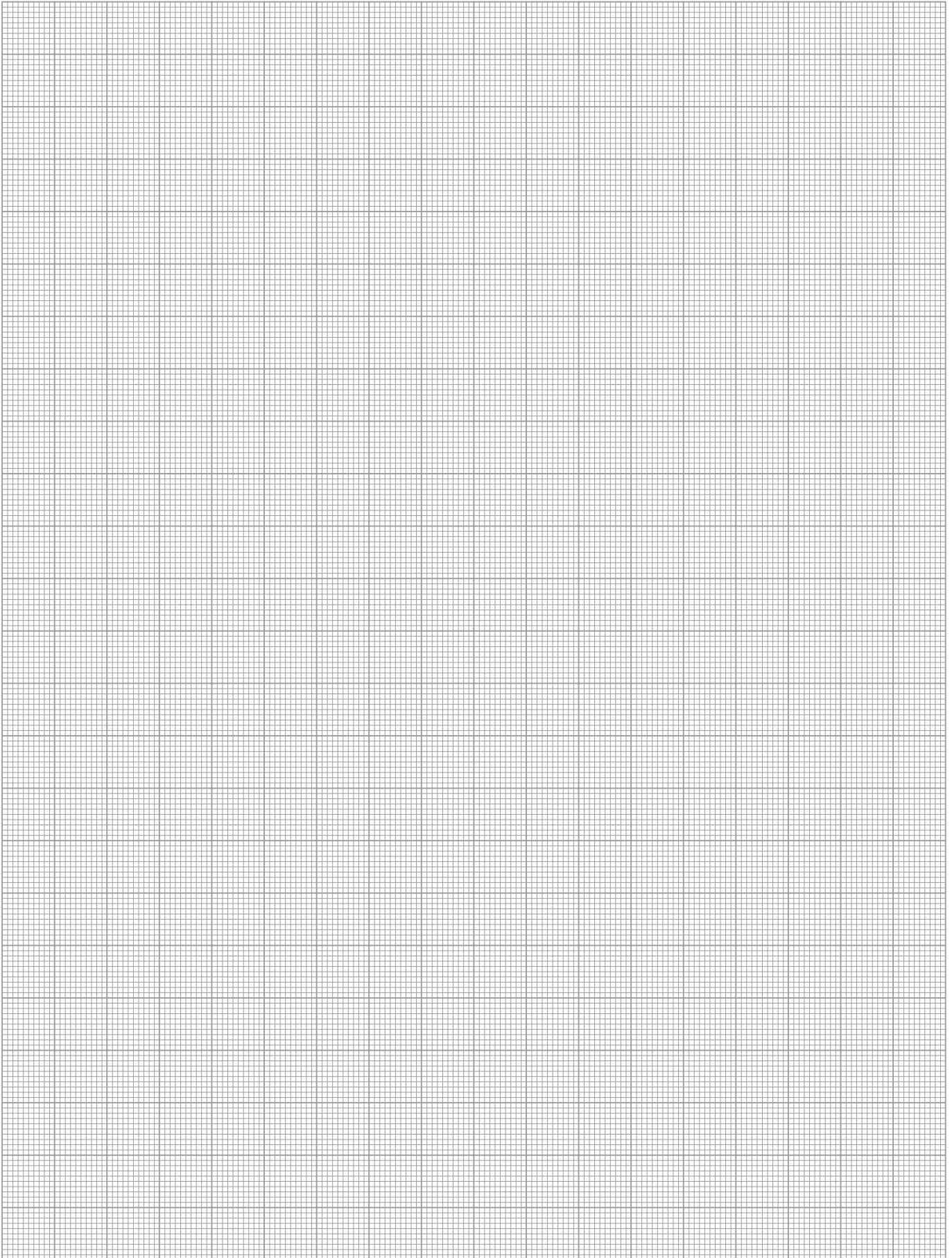
## Sensor system



Locking sensor for monitoring the lock condition

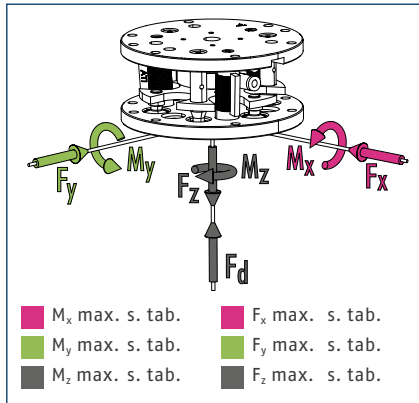
Description	ID	Often combined
<b>Inductive proximity switches</b>		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
<b>Cable extensions</b>		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
<b>Clip</b>		
CLI-M12	0301464	
CLI-M8	0301463	
<b>Connection cables</b>		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
<b>Sensor distributor</b>		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

- ① Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.





### Forces and moments

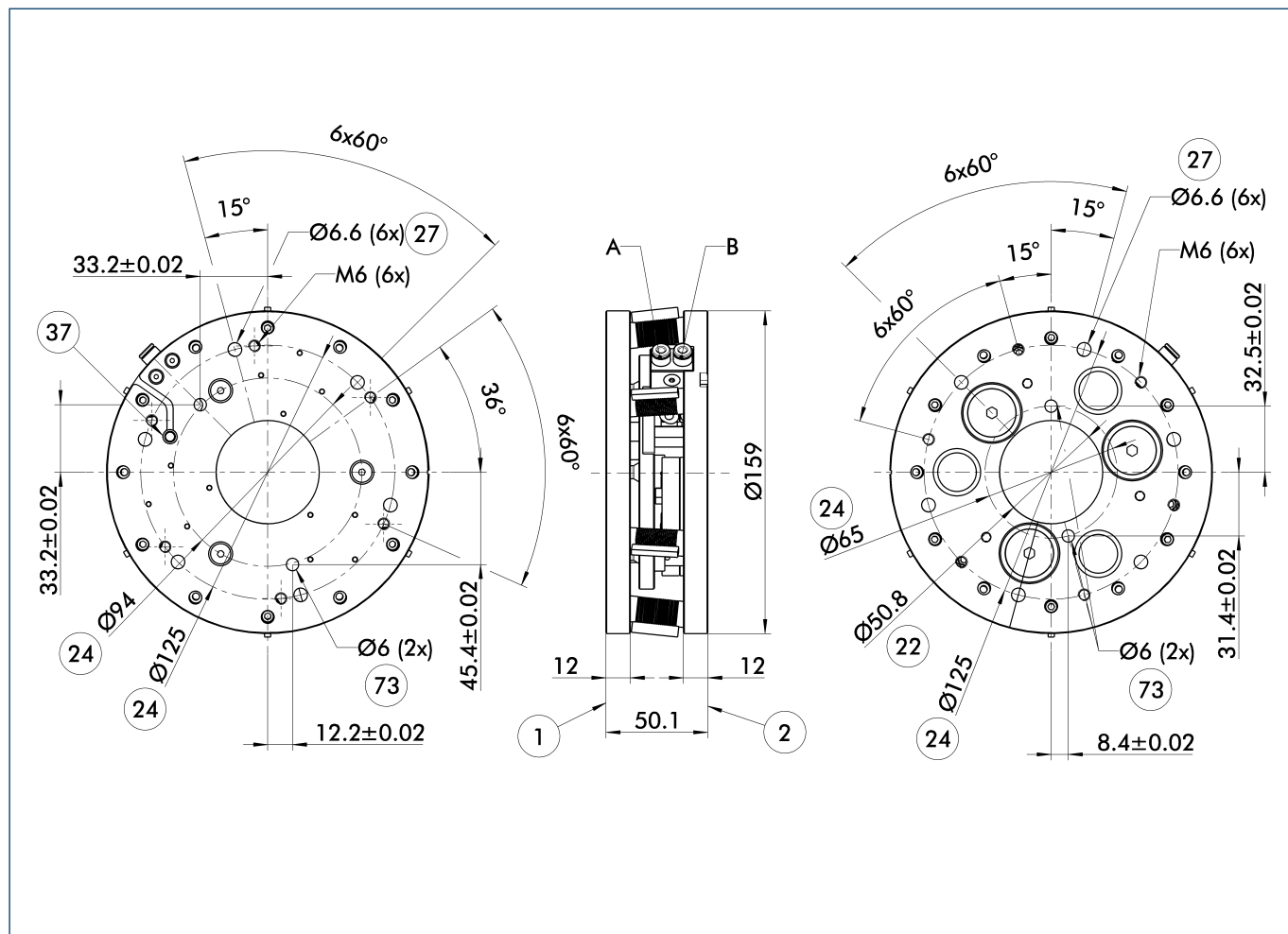


ⓘ The forces and torques are maximum values when unlocked and may occur simultaneously. When locked, only the loads caused by the weight and acceleration are permissible.

### Technical data

Description		FUS-413C	FUS-413D
ID		0320338	0320339
Compensation tension / pressure	[mm]	1.3	1.3
Compensation XY	[mm]	±2.2	±2.2
Angular compensation	[°]	1	1
Rotary compensation angle	[°]	2.5	2.5
Stiffness tension / pressure	[N/mm]	6300	12600
Stiffness displacement	[N/mm]	60	120
Compensation center clearance	[mm]	225	225
Repeat accuracy	[mm]	0.01	0.01
Mass	[kg]	1.6	1.8
min. / max. operating pressure	[bar]	5/6	5/6
min. / max. ambient temperature	[°C]	5/60	5/60
max. force $F_x/F_y$ vertical installation	[N]	196	391
max. force $F_x/F_y$ horizontal installation	[N]	27	54
max. force $F_z$	[N]	200	395
max. force $F_d$	[N]	2750	5490
Moments $M_x$ max./ $M_y$ max.	[Nm]	22.6/22.6	45.2/45.2

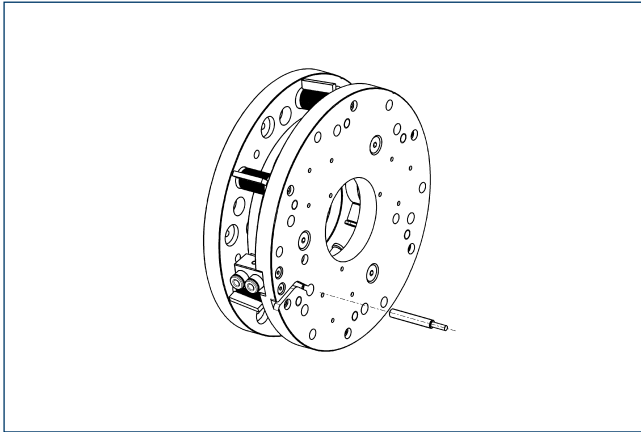
Main view



The main view shows the unit in its basic version.

- A, a Air connection locked
- B, b Air connection unlocked
- ① Robot side connection
- ② Tool side connection
- ②② Center bore
- ②④ Bolt circle
- ②⑦ Through-holes for screw connections
- ③⑦ Sensor connection
- ⑦③ Fit for a centering pin

## Sensor system



Locking sensor for monitoring the lock condition

Description	ID	Often combined
<b>Inductive proximity switches</b>		
IN 50-S-M12	0301575	
IN 50-S-M8	0301568	
INK 50-S	0301560	
<b>Cable extensions</b>		
KV BG12-SG12 3P-0030-PNP	0301999	
KV BG12-SG12 3P-0060-PNP	0301998	
KV BW08-SG08 3P-0030-PNP	0301495	
KV BW08-SG08 3P-0100-PNP	0301496	
KV BW08-SG08 3P-0200-PNP	0301497	●
KV BW12-SG12 3P-0030-PNP	0301595	
KV BW12-SG12 3P-0100-PNP	0301596	
KV BW12-SG12 3P-0200-PNP	0301597	
<b>Clip</b>		
CLI-M12	0301464	
CLI-M8	0301463	
<b>Connection cables</b>		
KA BG08-L 3P-0300-PNP	0301622	●
KA BG08-L 3P-0500-PNP	0301623	
KA BG12-L 3P-0500-PNP	30016369	
KA BW08-L 3P-0300-PNP	0301594	
KA BW08-L 3P-0500-PNP	0301502	
KA BW12-L 3P-0300-PNP	0301503	
KA BW12-L 3P-0500-PNP	0301507	
<b>Sensor distributor</b>		
V2-M8	0301775	●
V2-M12	0301776	●
V4-M12	0301747	
V4-M8	0301746	
V8-M12	0301752	
V8-M8	0301751	

- ① Per unit one sensor (closer/S) is required, optionally a cable extension. Please note the minimum permitted bending radii for the sensor cables, which are generally 35 mm.

